
A New Species of *Dioscorea* (Dioscoreaceae) from Mesoamerica

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ABSTRACT. A new species from Mexico, *Dioscorea mesoamericana*, is described and illustrated. The new species is distinguished from *D. pumicicola* by its shorter pistillate inflorescences, the amorphous and geometrically fissured bark on the rhizome, and by the different geographical and altitudinal distribution. A key to separate the species, geographical distribution, ecological notes, and a detailed description of nervation patterns are given.

While reviewing a number of collections at the Gray Herbarium (GH) for the treatment of Dioscoreaceae for the *Flora Mesoamericana* project during 1987, the senior author found an interesting collection of an undescribed species in fruit from the state of Oaxaca, Mexico. This species was not included in that treatment of the Dioscoreaceae because of the lack of staminate material and because its distribution was thought to be outside the limits of that project. However, recently this same species was found by the junior author in the state of Chiapas, Mexico. Furthermore, staminate material of the species was obtained, so that it is now possible to confidently describe this new species.

Dioscorea mesoamericana O. Téllez-Valdés & Martínez-Rodríguez, sp. nov. TYPE: Mexico. Chiapas: Municipio Tonala, Cerro de Tres Picos, 15°58'N, 93°36'W, alt. 350 m, 23 jun. 1992 (♂♀), I. A. Martínez R., I. Sánchez G., M. A. Otero & C. G. Montes C. 5190 (holotype, MEXU; isotypes, ENCB, MO). Figure 1.

Caules dextrorsum volubiles. Folia (6-)9-24 cm longa, (6-)9-24 cm lata, 3-lobata, ovato-lanceolata vel suborbiculata, (7-)9-11-nervata; perianthium purpuratum; stamina 6. Inflorescentia pistillata racemosa 3-5 cm longa, pedunculo 5 mm longo. Capsulae 1.2-1.8 cm longae, 1.4-2.0 cm latae; semina 6-7 mm longa, 4.5-5 mm lata, circumcirca alata.

Twining herbaceous vine. Rhizomes hypogeous, amorphous, growing horizontally, lobed; bark light brown, fissured to slightly angled, the inner bark

white. Stems dextrorsely twisting, sometimes with short brachyblasts sharing groups of leaves at the apex. Blades (6-)9-24 cm long, (6-)9-24 cm wide, 3-lobed, ovate-lanceolate to suborbicular, hirsutulous, (7-)9-11-nerved, the base rounded, cordate, the basal sinus campanulate, the apex acute; petiole 1.7-4.5 cm long. Staminate inflorescence paniculate, with cymose branches 5-20 cm long; floral bract 2 mm long, one per flower, ovate-lanceolate, acuminate; flowers 2-3, arranged in a cymule, sessile or pedicellate, the pedicels 1.5 mm long; perianth purple, the tepals 2 mm long, patent; stamens 6, 0.1-0.2 mm long, antrorse, inserted at the torus; pistillode 0.1-0.3 mm, showing different stages of abortion, from inconspicuously trifold to conic. Pistillate inflorescence a raceme 3-5 cm long; peduncles 5 mm long; staminodia 6, 0.1 mm long, inserted at the torus; stylar column 0.3 mm high; styles umbraculate or festoneate. Capsules 1.2-1.8 cm long, 1.4-2.0 cm wide, suborbicular to subquadrate, the base and apex retuse to rounded; seeds 6-7 mm long, 4.5-5 mm wide, oblong to subquadrate, rusty, winged all around, 2 by locule.

Distribution. *Dioscorea mesoamericana* is endemic to the region of the Isthmus of Tehuantepec at the boundary of the states of Oaxaca and Chiapas in Mexico. It occurs in tropical deciduous and semideciduous forests, as well as nearby riparian forest. It ranges from 100 to 400 m altitude. The soils in which it grows are characteristically black, rocky, with a high organic content. Flowering and fruiting occurs between June and September.

As part of a monographic study of the genus *Dioscorea* for Mexico, Central America, and eventually all the Americas, a general survey of *Dioscorea* characters using several techniques is being carried out. One of these is the description of the venation pattern of *Dioscorea* leaves. Because leaf venation pattern has taxonomic significance, we include a brief description according to outline of leaf-architectural characters described by Hickey (1973) and adapted for monocots by Howard (1983). The

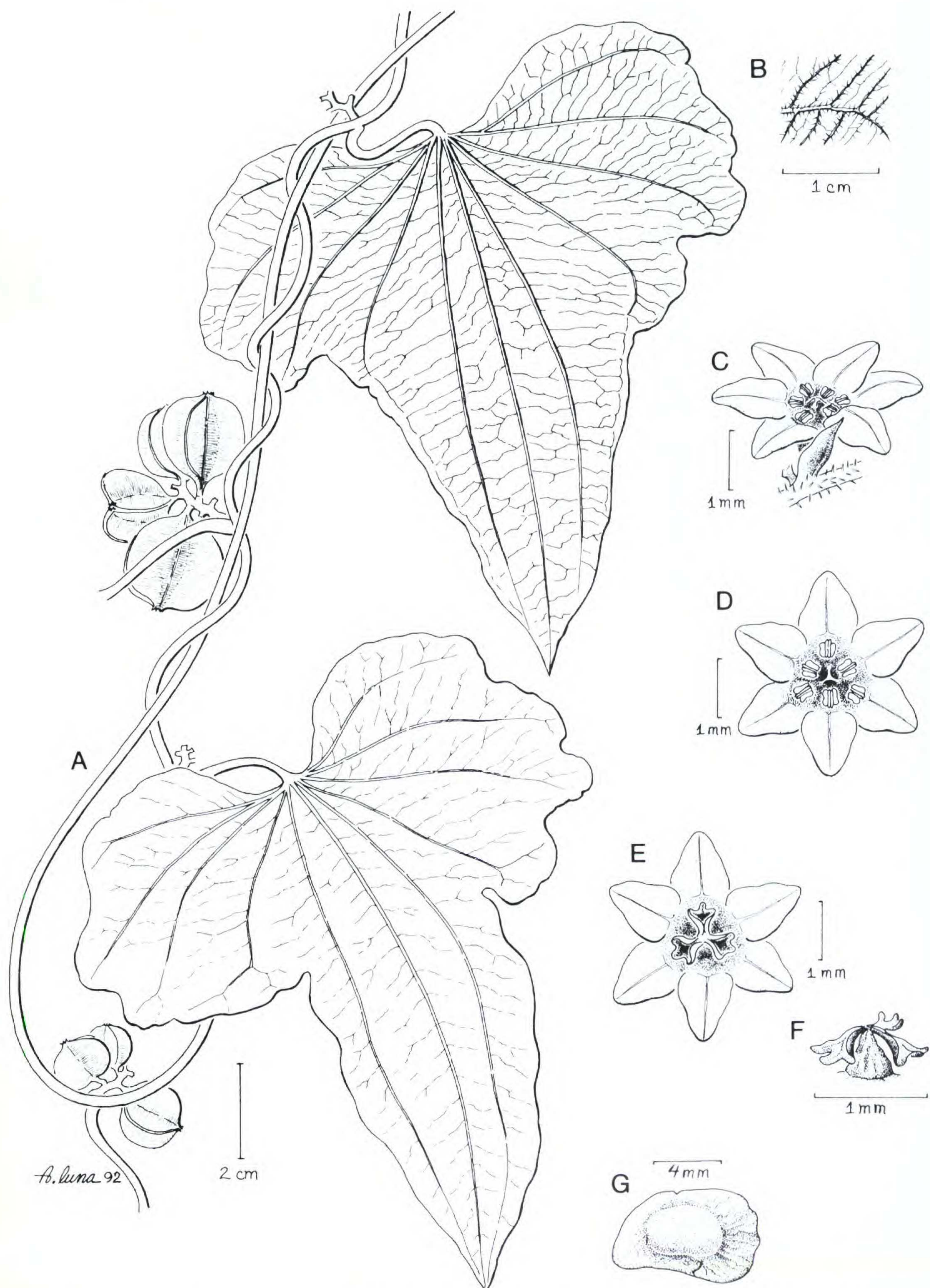


Figure 1. *Dioscorea mesoamericana* O. Téllez-Valdés & Martínez-Rodríguez. —A. Pistillate plant habit, showing the dextrorse stems and the short infructescences. —B. Detail of leaf pubescence. —C, D. Staminate flower, two views. —E. Pistillate flower. —F. Stylar column, showing styles. —G. Winged seed (all from Martínez-Rodríguez et al. 5190).

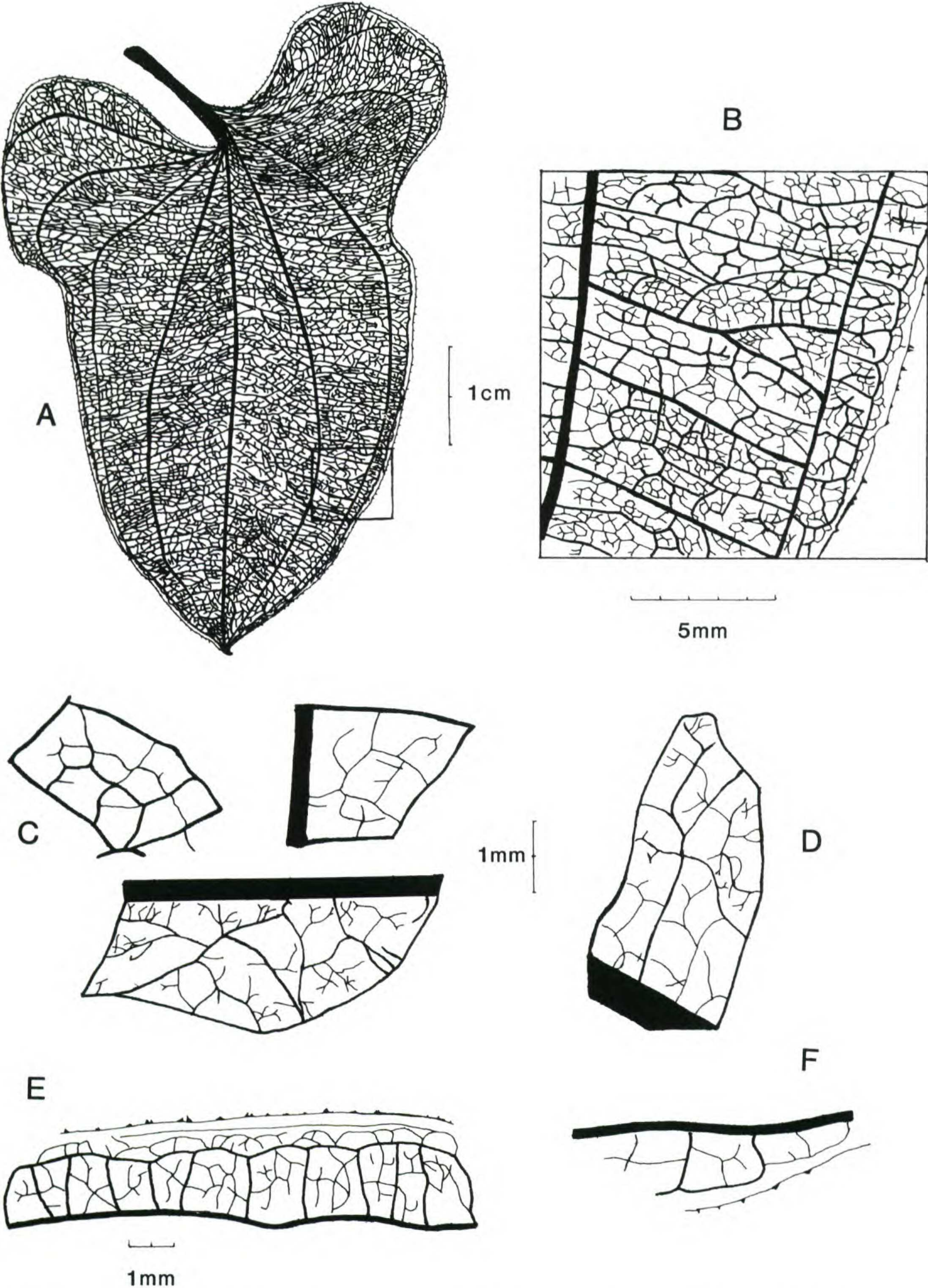


Figure 2. *Dioscorea mesoamericana* O. Téllez-Valdés & Martínez-Rodríguez. —A. Leaf venation pattern. —B. Detail of primary and secondary veins. —C, D. Areoles and higher-order vein variation. —E, F. Ultimate marginal nervation (all from *De Long* 16 (Coll. 1038)).

clearing technique followed is the one proposed in Radford et al. (1974). Whole leaves and higher-order veins were photographed with Panatomic X and Gold Kodakolor (100 ISO) films. Drawings were made from these photographs.

The leaves are dorsiventrally oriented; the texture is membranaceous to slightly chartaceous; the petiole is normal, with the proximal and distal ends (pulvinulous) inflated. The primary venation pattern is campylodromous (Fig. 2A) with an acropetal weakening of the primary veins very pronounced; the size of the primary veins is weak (1.1%), from straight to slightly curved; there is the tendency for primary veins to anastomose apically with one another. Secondary veins arise from the admedial primary vein in a pinnate arrangement, or they extend across the panel and fuse with the exmedial primary, or they may ramify and end blindly, with moderate thickness, and run straightforward (Fig. 2B). Tertiary veins arise at a right angle and branch transversely. Higher(4° and 5°)-order veins are thinner and also arise at a right angle; all (3°, 4°, and 5°) run throughout randomly and/or sometimes orthogonally. The ultimate marginal nervation is looped (Fig. 2E, F). The areoles are usually isodiametric or incompletely closed meshes with no predominant orientation, with a medium (0.3–1 mm) to large (1–2 mm) diameter. Veinlets are simply curved to often once- or twice-branched; the ramifying veinlets have free-vein endings (Fig. 2C, D).

Dioscorea mesoamericana belongs to section *Apodostemon* Uline. It is closely related to *D. pumicicola* Knuth, because they both share the following characteristics: one bract per flower, lobed leaves, and a similar type of pubescence. However, *D. mesoamericana* is distinguished from *D. pumicicola* by its amorphous rhizomes that grow horizontally, and fissured bark that is slightly sculptured by geometrical patterns, as well as by the short infructescences and the different geographic and altitudinal distributions. In contrast, *D. pumicicola* has grouped spherical rhizomes that are linked by narrow necks, its bark is smooth, and the infructescences are longer. *Dioscorea pumicicola* is endemic to the state of Morelos in Mexico. It grows at approximately 1,500 m altitude.

The specific epithet commemorates the international and interinstitutional (MEXU, MO, BM) collaborative effort of the *Flora Mesoamericana* project, which covers all plants of southern Mexico south of Oaxaca and Veracruz, and Central America to the Panamanian–Colombian border.

ARTIFICIAL KEY TO THE LOBATE SPECIES OF *DIOSCOREA* SECT. *APODOSTEMON* IN MESOAMERICA (MODIFIED FROM TÉLLEZ-VALDÉS & SCHUBERT, IN PRESS)

- 1a. Leaves, petioles, and rachis of inflorescences glabrous; endemic to Honduras *D. koepperi* Standley
- 1b. Leaves, petioles, and rachis of inflorescences pilose.
 - 2a. Staminate flowers 1 mm long, light brown, pilose, grouped in compact cymules; pedicels less than 0.7 mm long; 2 bracts per flower; leaves hastate; endemic to Guatemala ... *D. aguilarii* Standley & Steyermark
 - 2b. Staminate flowers 2–3 mm long, purple, glabrous, grouped in spreading cymules; pedicels 1.5 mm long; 1 bract per flower; leaves lobate; endemic to Mexico.
 - 3a. Pistillate inflorescences 3–5 cm long, peduncle 5 mm long; leaf blades (7–) 9–11-nerved *D. mesoamericana* Téllez-Valdés & Martínez-Rodríguez
 - 3b. Pistillate inflorescences 10 cm long, peduncle 4–5 cm long; leaf blades 7-nerved *D. pumicicola* Knuth

Paratypes. MEXICO. **Oaxaca:** Juchitan, G. R. De-long 16 (♀), (Coll. 1038, A). **Chiapas:** Arriaga, San Ramon, A. I. Martínez R. et al. 4331 (♀), 4364 (♀), 4454 (♀), 4860 (FCUNAM, MEXU); Tonala, Cerro de Tres Picos, A. I. Martínez R. et al. 5061 (♀), 5091 (♀) (FCUNAM, MEXU).

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Literature Cited

Hickey, J. L. 1973. Clasificación de la arquitectura de las hojas de dicotiledóneas. Bol. Soc. Argent. Bot. 16: 1–26.
Howard, C. M. 1983. The vegetative morphology of the reticulate-veined Liliiflorae. Telopea 2: 401–412.
Radford, A. E., W. C. Dickison, J. R. Masey & R. R. Bell. 1974. Vascular Plant Systematics. Harper & Row, New York.
Téllez-Valdés, O. & B. G. Schubert. 1993. Sinopsis de *Dioscorea* sección *Apodostemon* (Dioscoreaceae). Acta Bot. Mex. (in press).